

What is claimed is:

1. A direct acting pressure reducing valve comprising:

a valve-inlet pressure introduction port;

5 a valve-outlet pressure output port;

a main valve for opening and closing a communicating conduit via which said valve-inlet pressure introduction port and said valve-outlet pressure output port are communicatively connected with each other;

10 a pilot pressure chamber formed with a flexible diaphragm member to be communicatively connected with said valve-outlet pressure output port;

a cylindrical communicating hole via which said pilot pressure chamber and said communicating conduit are
15 communicatively connected with each other;

a connecting rod inserted in said cylindrical communicating hole to be slidably movable therein and positioned between said flexible diaphragm member and said main valve; and

20 a pressure-adjusting biasing member for biasing said flexible diaphragm member in a direction to open said main valve,

wherein an insertion portion of said connecting rod which is inserted in said cylindrical communicating hole
25 is shaped to have a partly-deformed circular cross section,

a distance from a deformed portion of the partly-deformed circular cross section to a center of an imaginary circle corresponding to an inner peripheral surface of said cylindrical communicating hole being smaller than a radius
5 of said imaginary circle, and

wherein a non-deformed portion of said partly-deformed circular cross section of said insertion portion serves as a guide portion for guiding said connecting rod along an axis of said cylindrical communicating hole, while
10 said deformed portion of said partly-deformed circular cross section of said insertion portion serves as an air passage via which said communicating conduit and said pilot pressure chamber are communicatively connected with each other.

15 2. The direct acting pressure reducing valve according to claim 1, wherein the shape of said insertion portion constitutes a major portion of an imaginary cylindrical rod, and wherein said deformed portion of said insertion portion of said connecting rod comprises a flat
20 portion which defines a cut-off portion of said imaginary cylindrical rod, said flat portion extending in an axial direction of said imaginary cylindrical rod.

3. The direct acting pressure reducing valve according to claim 1, wherein said connecting rod comprises
25 a flange portion provided at an end of said connecting rod

in said pilot pressure chamber, and

wherein a surface of said flange portion adjacent to said cylindrical communicating hole includes a recessed portion communicatively connected with said deformed
5 portion of said insertion portion of said connecting rod.

4. The direct acting pressure reducing valve according to claim 1, said direct acting pressure reducing valve comprising a body and a bonnet, wherein an outer edge of said flexible diaphragm member is held tight between
10 said body and said bonnet, and

wherein said body includes said valve-inlet pressure introduction port, said valve-outlet pressure output port, and a communicating conduit via which said valve-inlet pressure introduction port and said valve-outlet pressure
15 output port are communicatively connected with each other.

5. The direct acting pressure reducing valve according to claim 4, wherein said cylindrical communicating hole is formed on a bushing which is screwed into said communicating conduit.

20 6. The direct acting pressure reducing valve according to claim 4, wherein said pressure-adjusting biasing member comprises a compression coil spring positioned in said bonnet.

7. The direct acting pressure reducing valve
25 according to claim 3, wherein said connecting rod comprises

a pushing portion positioned at the other end of said connecting rod, and

wherein said direct acting pressure reducing valve further comprises a biasing member for biasing said main valve against an end of said pushing portion.

8. A direct acting pressure reducing valve comprising:

a valve-inlet pressure introduction port;

a valve-outlet pressure output port;

10 a main valve for opening and closing a communicating conduit via which said valve-inlet pressure introduction port and said valve-outlet pressure output port are communicatively connected with each other;

15 a pilot pressure chamber formed with a flexible diaphragm member to be communicatively connected with said valve-outlet pressure output port;

a cylindrical communicating hole via which said pilot pressure chamber and said communicating conduit are communicatively connected with each other;

20 a connecting rod inserted in said cylindrical communicating hole to be slidably movable therein and positioned between said flexible diaphragm member and said main valve; and

a pressure-adjusting biasing member for biasing said flexible diaphragm member in a direction to open said main

valve,

wherein said direct acting pressure reducing valve operates so that a pressure in said pilot pressure chamber acts on said flexible diaphragm member to be in equilibrium
5 with a biasing force of said pressure-adjusting biasing member, and

wherein a portion of an inner peripheral surface of said cylindrical communicating hole is recessed radially outwards to serve as an air passage which is elongated in
10 an axial direction of said cylindrical communicating hole, said communicating conduit and said pilot pressure chamber being communicatively connected with each other via said air passage.

9. The direct acting pressure reducing valve
15 according to claim 8, said direct acting pressure reducing valve comprising a body and a bonnet, wherein an outer edge of said flexible diaphragm member is held tight between said body and said bonnet, and

wherein said body includes said valve-inlet pressure
20 introduction port, said valve-outlet pressure output port, and a communicating conduit via which said valve-inlet pressure introduction port and said valve-outlet pressure output port are communicatively connected with each other.

10. The direct acting pressure reducing valve
25 according to claim 9, wherein said cylindrical

communicating hole is formed on a bushing which is screwed into said communicating conduit.

11. The direct acting pressure reducing valve according to claim 9, wherein said pressure-adjusting
5 biasing member comprises a compression coil spring positioned in said bonnet.